

ISO 50001 Energy Management Systems standard certification

Catalyst Paper (Crofton)

A strong mandate to cut costs leads to a cultural shift toward improving energy efficiency

ISO 50001 Energy Management Systems standard certification

ISO 50001 provides organizations with a structured framework to manage energy in such a way that it can increase energy efficiency, reduce costs and improve energy performance. This standard is based on the common elements found in all the ISO management systems standards, assuring a high level of compatibility with ISO 9001 (quality management) and ISO 14001 (environmental management). It integrates energy efficiency into management practices by making better use of existing energy-consuming processes. Based on the Plan-Do-Check-Act cycle, this standard integrates both technical and managerial activities.



CASE STUDY SNAPSHOT

Industry: Pulp and paper

Energy management system guidance/standard: CAN/CSA-ISO 50001

Improvement focus: Energy performance improvements with a focus on thermo-mechanical pulping, self-power generation, the steam system and boilers

Location: Duncan, British Columbia, Canada

Products: Newsprint, kraft pulp

Payback period: Two months after ISO 50001 implementation

Number of employees: 595

Energy sources: Electricity, natural gas, gasoline, diesel

2015 energy management objective: Reduce purchased power by 3.2 percent

Photo: Catalyst Crofton Mill power and recovery area

Canada

ISO 50001 certification overview

Catalyst Paper (Crofton) exceeded its own expectations for improving energy efficiency when it built an energy management system (EnMS) to improve its bottom line. Setting an ambitious goal of a 3.2 percent energy saving over three years, Crofton realized a 4.8 percent saving over just two years.

Keys to this success included an energetic and resourceful energy manager, excellent mentorship in the ISO 50001 certification process and strong senior management buy-in from the start. The company's urgent need to cut costs was an essential motivator. The best news? Crofton is operating more efficiently than ever before.

Company profile

Located on southern Vancouver Island near the town of Duncan, Catalyst Paper's Crofton division is British Columbia's only integrated paper and pulp manufacturing plant and is the largest of Catalyst Paper's three Canadian divisions. Crofton operates two paper machines and two pulp machines, producing newsprint (349,000 tonnes per year) and kraft pulp (335,000 tonnes), which is used to manufacture printing, writing and tissue papers. Crofton employs 595 people.

Since 2007, Crofton has participated in the industrial Power Smart program with BC Hydro, which positioned the company well for implementing ISO 50001 in 2015. When Crofton embarked on its ISO certification process, it had an energy management team that included senior management. It also had a good deal of experience implementing energy management projects and had already achieved ISO 9001 and 14001 certification.

Business case for energy management

The pulp and paper industry is energy-intensive, and firms across this sector are continually looking for ways to minimize their energy costs. For Crofton, which uses thermal mechanical pulping as a key manufacturing process, energy expenses are second only to the cost of fibre for making products. Catalyst Paper is BC Hydro's biggest customer, and Crofton is the largest consumer among Catalyst's three divisions in British Columbia.

For this reason, Crofton has been managing its energy consumption since 2007 with the focus on becoming more efficient. Until recently, energy management



Catalyst Crofton Mill thermomechanical pulping control room. TMP Process Specialist Bob Reilly (standing left), Energy Manager Edinson Mahecha (standing right) with two pulping control room operators (sitting)

was project-driven. That meant that success tended to depend on the particular talents of the energy manager who happened to be on staff – and whether the company had funds available for capital projects. “Before 2011, we had a good plan and were making progress,” says Edinson Mahecha, Crofton's Energy Manager, who shepherded the company through its ISO 50001 certification. “But we had no framework, such as records, processes and consistency, integrated into our business plan.”

In 2011–2012, everything changed. Crofton experienced significant business challenges and needed to trim costs. Meanwhile, BC Hydro announced that electricity costs would increase by 27 percent over five years. Suddenly, accountability for energy management was a key priority for Crofton. A decision was made to explore a more formal process for managing energy, including implementing ISO 50001.

Crofton estimated it could reduce its energy expenditure by 3.2 percent in three years. That goal came with costs:

- Hiring expert consultants,
- Conducting awareness training in energy efficiency.
- Managing a significant increase in documentation.
- Capital costs for equipment and software.

Crofton recognized that cost-sharing arrangements with BC Hydro and Natural Resources Canada (NRCan) could shorten the payback period for this important and major investment.

“By 2011, project-driven energy management was not enough. We needed to be more aggressive.”

With a strong culture of energy management, Crofton was well positioned to develop a framework for supporting ISO 50001 implementation. “We had BC Hydro and NRCan on our side and were benefitting a great deal from their cost-sharing programs,” says Mahecha. Crofton was already ISO 9001 and 14001 certified, so the company had a firm sense of the process.

Implementing an energy management system

In June 2012, Mahecha presented senior management with a business case that proposed a rationale, budget and process for implementing an EnMS. By the end of the year, Crofton contracted an independent consultant to do a gap analysis – invaluable for providing a realistic expectation for the EnMS. The gap analysis found Crofton well positioned for ISO 50001 certification, as it had strong practices for management review, taking corrective actions and managing documents. The consultant estimated it would take six months to achieve certification.

In 2013 and 2014 Crofton implemented its EnMS – a multi-step process that included a complete energy review and establishing a baseline for later comparison. During the implementation phase, Crofton established energy objectives and targets as well as a detailed six-month action plan for achieving those targets. The company then implemented the action plan, which focused on establishing a framework and identifying opportunities for energy efficiency improvements. This was followed by a performance check to ensure the actions were leading to tangible savings.

From the outset, Crofton also built a framework for monitoring into its overall plan, knowing that monitoring and careful reporting of a company’s energy savings actions are critical to the success of an EnMS. Only with meticulous monitoring can a company pinpoint where adjustments are needed and improve energy performance.

Encouraging a genuine culture of efficiency

Mahecha makes an important distinction when he describes Crofton’s journey to ISO 50001 certification. “During the six-month action plan, we followed the steps for ISO implementation, but we never *tried* to get certified,” he says. His point is that he encouraged a genuine culture in which ISO implementation was not the primary goal. “Instead, our goal was excellence in energy efficiency. Once that was our aim, the certification followed naturally.”

Mahecha explains that focusing on certification as an end in itself can distract employees from making improvements. “They are trying to impress the auditor instead of focusing on getting energy savings.” Mahecha told his teams to be honest and open with auditors with the objective of learning as much as possible. “I felt this was the best way to stimulate real change.”

The approach worked well. By late 2014, Crofton had all the elements in place for ISO 50001 certification, and in January 2015, the company’s certification came through.

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Engaging employees

Employee awareness and education were key elements of Crofton’s EnMS implementation plan. One tool developed by Catalyst Paper is called Opportunities for Improvement (OFI).

OFI is a continuous improvement program that includes a sharing and reward component in which the company sets improvement goals according to employee input. “All employees and contractors are encouraged to provide Crofton with ideas for being more profitable,” says Mahecha. If the goal succeeds, and the company achieves certain financial targets, a portion of the resulting savings is distributed to employees.

Energy University is an important element in employee training. This internal, computer-based program has a mandatory energy awareness component for all employees and contractors. Energy University teaches the benefits of more energy-efficient lighting, compressed air and leak management, pumps, and motors and variable frequency drives. It also ensures that each employee understands their role

in improving energy efficiency in each area. Ninety-six percent of Crofton's employees have completed the mandatory awareness program. A second, more advanced and optional training component was introduced at Crofton in late 2015. BC Hydro is a major sponsor of this work.

Additional awareness efforts include general energy awareness for all employees on an ongoing basis, energy awareness information for visitors, contractors and temporary employees, and targeted energy procurement awareness for Crofton's procurement and information technology departments.

Building a winning team

BC Hydro was an important sponsor and partner in the early days of the certification process, and they designated an experienced energy consultant as an implementation coach. The coach appointed to Crofton had expertise in the pulp and paper industry as well as with ISO 50001 certification. Mahecha is convinced this was a key contributor to Crofton's success.

BC Hydro also contributed \$6,000 to the ISO 50001 certification process. NRCan provided an additional \$25,000 in cost-sharing for certification. Crofton also used NRCan's energy management information tools and training for ISO implementation, including ISO 50001 webinars and energy management information system tools.

Once Crofton's business case for an EnMS had been approved by senior management, Mahecha built an energy management team that would support the plan as simply as possible. The team includes senior managers who incorporate their responsibilities into the company's energy management efforts. As Mahecha describes it, these managers simply wear one more hat once a month at the company's energy management meetings. This helps keep extra people and bureaucracy out of the decision-making mix. It also lends greater authority to Crofton's plan. "Our EnMS is not a 'program'. It is responsibilities and expectations built into every aspect of our work."

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Challenges and barriers, lessons learned and results

Challenges and barriers

Senior management and employees can be skeptical and often need convincing in the early days of an EnMS. For example, senior managers at Crofton, without being informed of the financial benefit of ISO 50001 certification, were reluctant to commit internal resources. In addition, some parties expressed concern over the additional paperwork associated with ISO 50001 certification and had to be convinced that certification was worth the extra effort. A strong business case was needed to convince all these parties.

Traditionally, energy had not been a priority for Crofton. Instead, the company was focused on safety and quality, with safety as the overriding priority. Therefore, a fundamental culture change was also needed.

Results

Using 2012 as its baseline year, Crofton's cumulative energy reduction for 2013 and 2014 was 4.8 percent, or 100 gigawatt-hours (GWh). (The reduction is the energy that it was able to avoid purchasing from BC Hydro because of its energy efficiency upgrades.) Crofton achieved these reductions by implementing energy efficiency projects with a focus on targeting significant energy users, improving operational controls and becoming more energy aware.

Energy savings were realized in the following areas:

- Incremental power generation.
- Optimization of bleach chemical mixers.
- Optimization of blow tanks.
- Reduced energy intensity for thermo-mechanical pulping and advanced thermo-mechanical pulping.
- Optimization of demand control.
- Upgraded power meters and energy management information system.
- Upgraded metal halide to LED lighting in six warehouses.

In addition, Crofton generates its own power and steam entirely from biomass clean energy. This generates 40 Megawatt (MW) of power.

Next steps for Crofton

Mahecha says that performance improvements will continue to be Crofton's focus under its new ISO 50001 certification. "We will of course continue to maintain the ISO certification, but our work was never about the certification. It was about finding savings by being more energy-efficient."

Crofton's over-the-top success in achieving 4.8 percent savings in two years instead of 3.2 percent in three years has set the bar high. All future projects will be formally embedded into Crofton's financial model. "We are not idealistic – we are realistic. This is not about dreaming – it is about coming out with accurate, achievable targets."

Keys to success

Mahecha is convinced that collaboration between industry and government is the surest route to a successful EnMS. Costs are high and implementation can be complex – and Crofton succeeded partly because of the tools and cost-sharing they were able to access.

Another reason Crofton succeeded was that it defined an energy policy that was realistic, useful and precise. Its EnMS had four clear goals:

- Review energy intensity.
- Review or minimize the use of fossil fuels.
- Increase or maximize generating internal power from biomass.
- Always reduce the impact on the environment.

Working with an experienced implementation coach was essential to the company's early success. In Crofton's case, it was United States energy consultant EnerNOC Inc. The coach had experience in ISO 50001 certification as well as in the pulp and paper industry.

Lessons learned

- Make sure you deliver what you promise. If you do not, you will fail to achieve buy in and your EnMS will not be sustainable.
- Money talks. When you are making your case, frame energy management as financially beneficial.
- Embed energy management in business practices rather than treating it as a mere "program" or "project."
- Effective energy planning means being able to replicate all the steps. Effective mapping is essential to a successful EnMS.
- Senior management needs to be on board and accountable for savings. This motivates them to participate in the process.
- Focus on overall performance and savings, not the raw numbers of your energy "score."
- Do not try to impress auditors with sophisticated ISO language. Instruct employees and managers to ask sincere questions and expect valuable answers.
- Use ISO auditors as resources. Ask penetrating questions and accrue tangible value as a result.

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